
Recent trends in incidence, survival and mortality of lung cancer in Northern Ireland

(A comparison between April-December of 2021, 2020 and 2018-2019)

Further information

Further information is available at: www.qub.ac.uk/research-centres/nicr

Phone: +44 (0)28 9097 6028 **e-mail:** nicr@qub.ac.uk

Acknowledgements

The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

NICR is funded by the Public Health Agency and is based in Queen's University, Belfast.



INCIDENCE

During the April-December period the number of cases of lung cancer diagnosed decreased between 2018-2019 and 2021 by 1.6% from 1,036 cases per year to 1,019 cases.

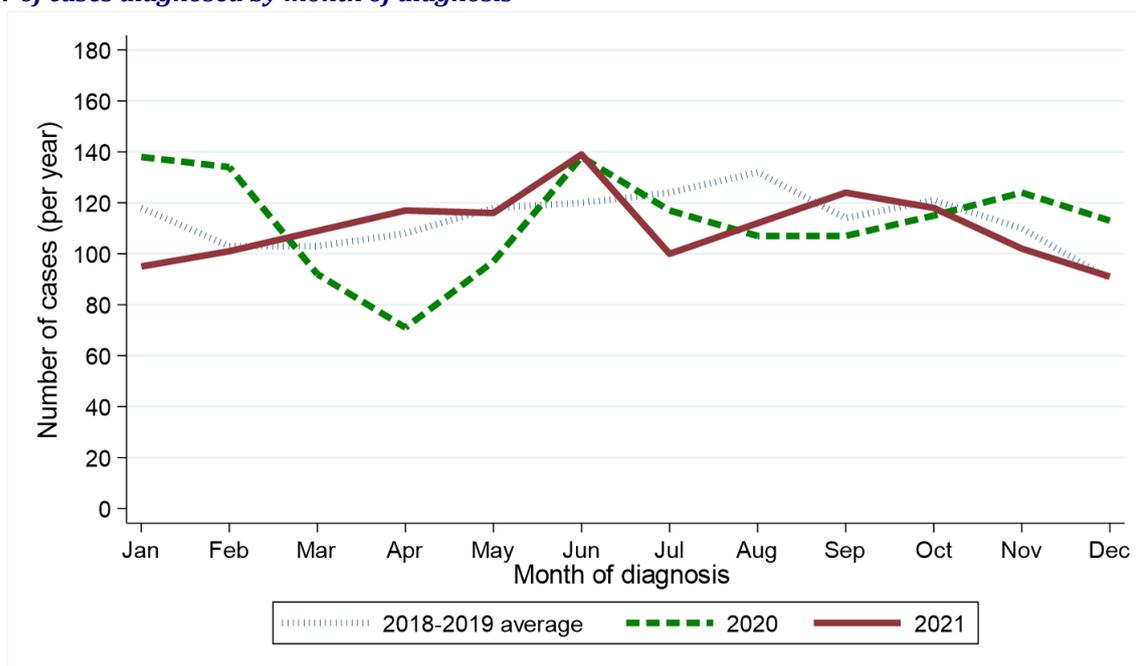
Table 1: Number of lung cancer cases diagnosed in 2018-2021 by month and year of diagnosis

Period of diagnosis	Annual total	Month diagnosed											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2018-2019*	1,360	118	103	103	108	118	120	124	132	114	121	110	90
2020	1,353	138	134	92	71	97	138	117	107	107	115	124	113
2021	1,324	95	101	109	117	116	139	100	112	124	118	102	91

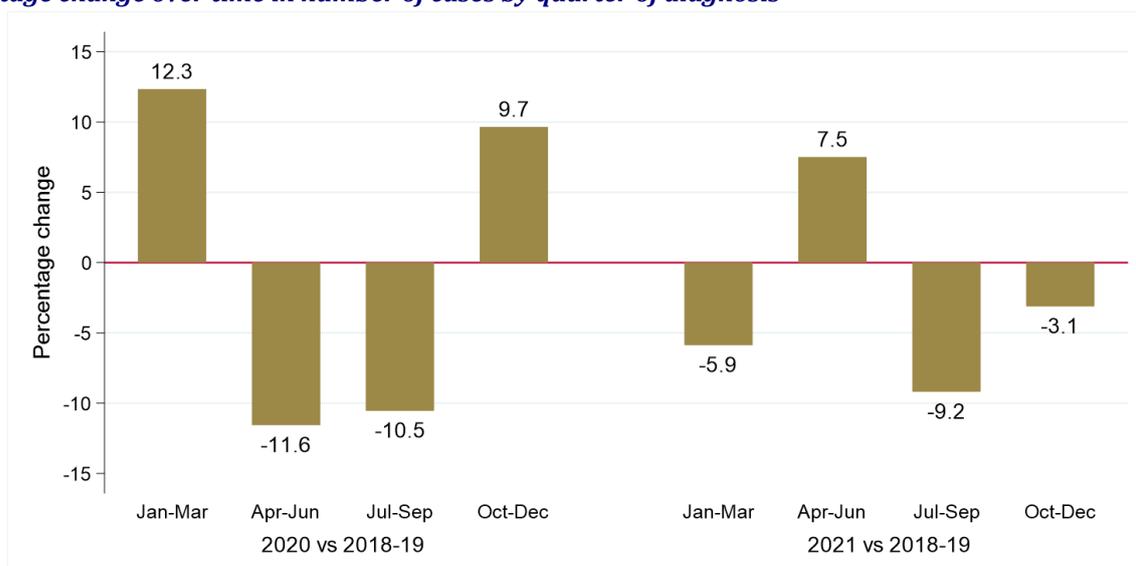
* Average cases per year rounded to the nearest integer. Row sums may thus differ slightly from the total.

Figure 1: Number of lung cancer cases diagnosed in 2018-2021 by month/quarter and year of diagnosis

(a) Number of cases diagnosed by month of diagnosis



(b) Percentage change over time in number of cases by quarter of diagnosis



GENDER

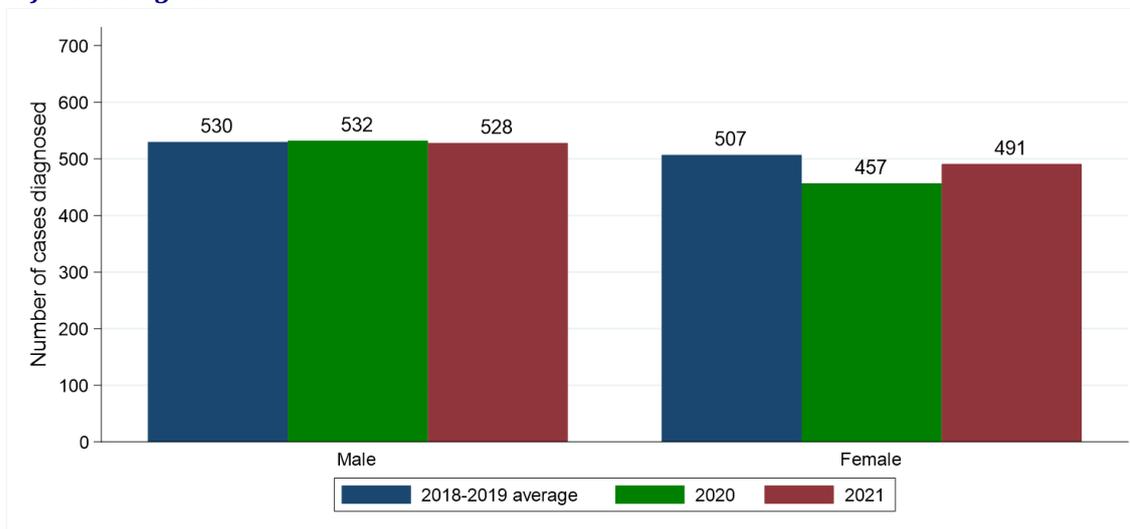
Excluding the first quarter of each year the number of male lung cancer cases diagnosed decreased by 0.4% from 530 per year in 2018-2019 to 528 in 2021. Between the same two time periods the number of female lung cancer cases diagnosed decreased by 3.2% from 507 per year in 2018-2019 to 491 in 2021. The change in case distribution by gender between 2018-2019 and 2021 was not statistically significant.

Table 2: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by gender and period of diagnosis

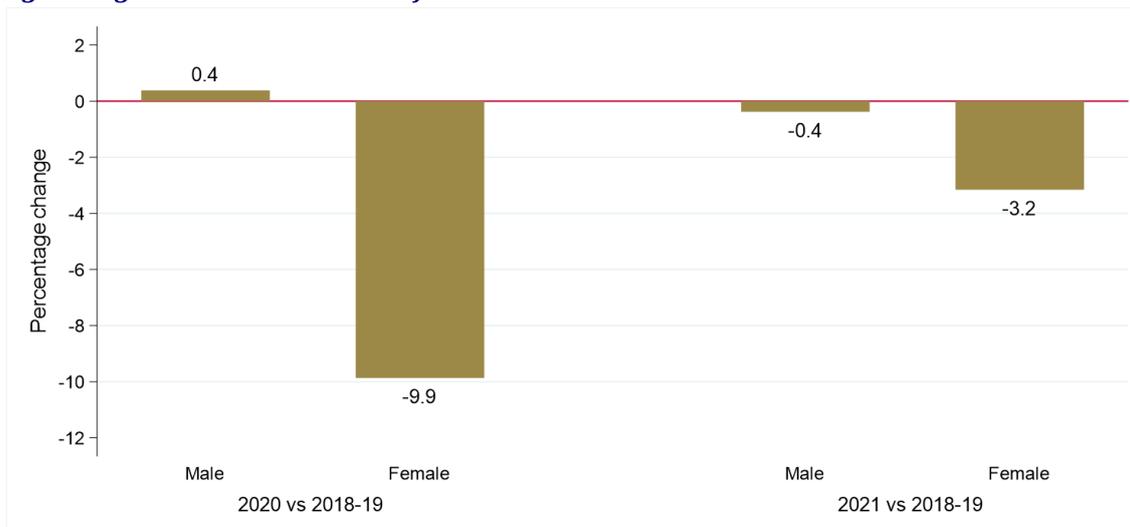
Gender	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All persons	1,036	989	1,019	-4.5%	-1.6%
Male	530 (51.2%)	532 (53.8%)	528 (51.8%)	+0.4%	-0.4%
Female	507 (48.9%)	457 (46.2%)	491 (48.2%)	-9.9%	-3.2%

* Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.

Figure 2: Number of lung cancer cases diagnosed in April-December of 2018-2021 by gender and period of diagnosis
(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



AGE

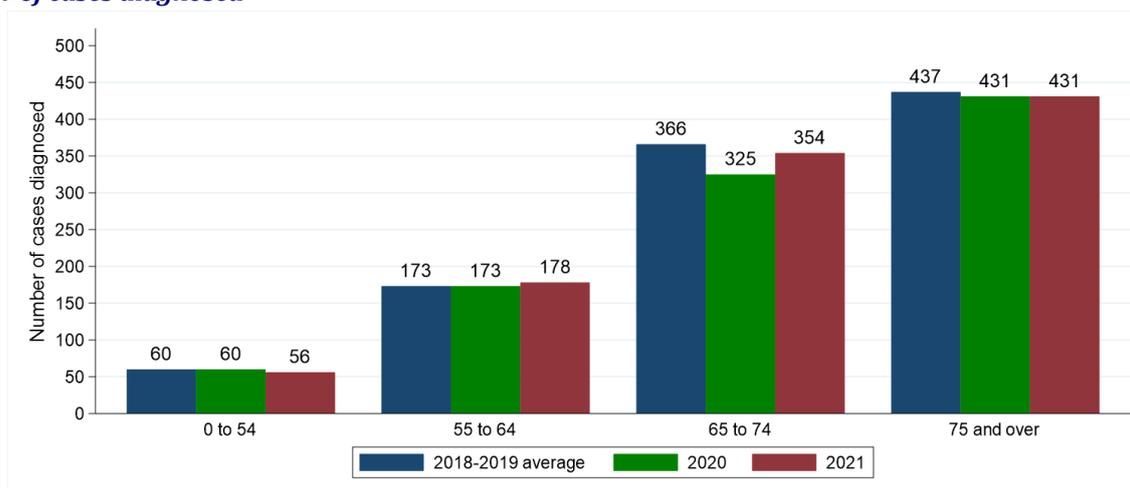
Excluding the first quarter of each year the number of cases of lung cancer diagnosed among those aged 0 to 54 decreased by 6.7% from 60 per year in 2018-2019 to 56 in 2021. Between the same two time periods the number of cases of lung cancer diagnosed among those aged 55 to 64 increased by 2.9% from 173 per year in 2018-2019 to 178 in 2021. The change in case distribution by age between 2018-2019 and 2021 was not statistically significant.

Table 3: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by age and period of diagnosis

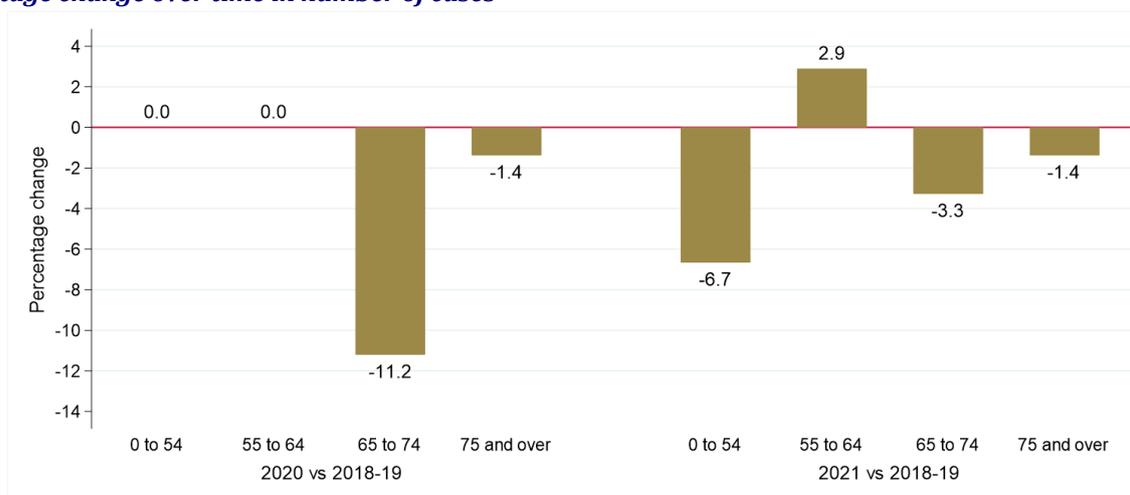
Age	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All ages	1,036	989	1,019	-4.5%	-1.6%
0 to 54	60 (5.8%)	60 (6.1%)	56 (5.5%)	0.0%	-6.7%
55 to 64	173 (16.7%)	173 (17.5%)	178 (17.5%)	0.0%	+2.9%
65 to 74	366 (35.3%)	325 (32.9%)	354 (34.7%)	-11.2%	-3.3%
75 and over	437 (42.2%)	431 (43.6%)	431 (42.3%)	-1.4%	-1.4%

* Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.

Figure 3: Number of lung cancer cases diagnosed in April-December of 2018-2021 by age and period of diagnosis
(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



HEALTH AND SOCIAL CARE TRUST

Excluding the first quarter of each year the number of cases of lung cancer diagnosed among those resident in Belfast HSCT decreased by 11.5% from 253 per year in 2018-2019 to 224 in 2021. Between the same two time periods the number of cases of lung cancer diagnosed among those resident in Southern HSCT increased by 7.5% from 186 per year in 2018-2019 to 200 in 2021. The change in case distribution by Health and Social Care Trust between 2018-2019 and 2021 was not statistically significant.

Table 4: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by Health and Social Care Trust and period of diagnosis

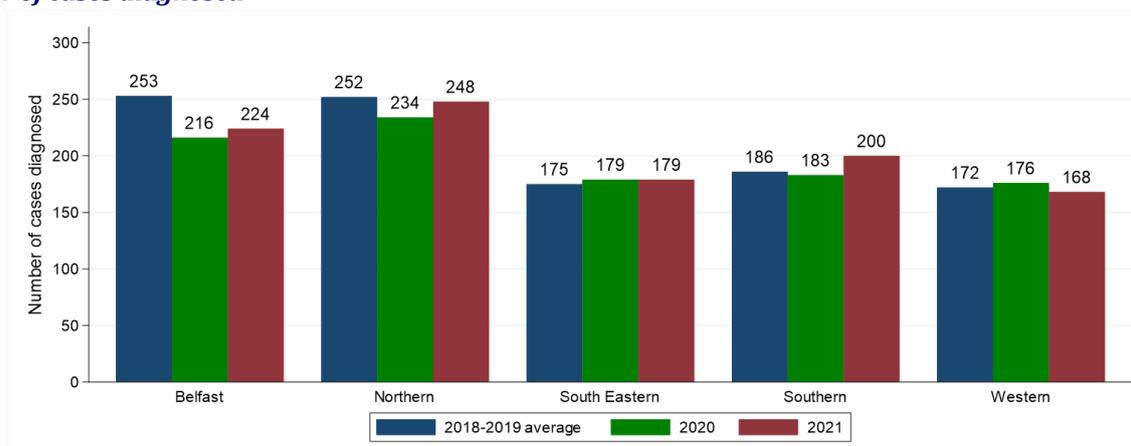
Health and Social Care Trust	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Northern Ireland	1,036	989	1,019	-4.5%	-1.6%
Belfast	253 (24.4%)	216 (21.8%)	224 (22.0%)	-14.6%	-11.5%
Northern	252 (24.3%)	234 (23.7%)	248 (24.3%)	-7.1%	-1.6%
South Eastern	175 (16.9%)	179 (18.1%)	179 (17.6%)	+2.3%	+2.3%
Southern	186 (18.0%)	183 (18.5%)	200 (19.6%)	-1.6%	+7.5%
Western	172 (16.6%)	176 (17.8%)	168 (16.5%)	+2.3%	-2.3%

* Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.

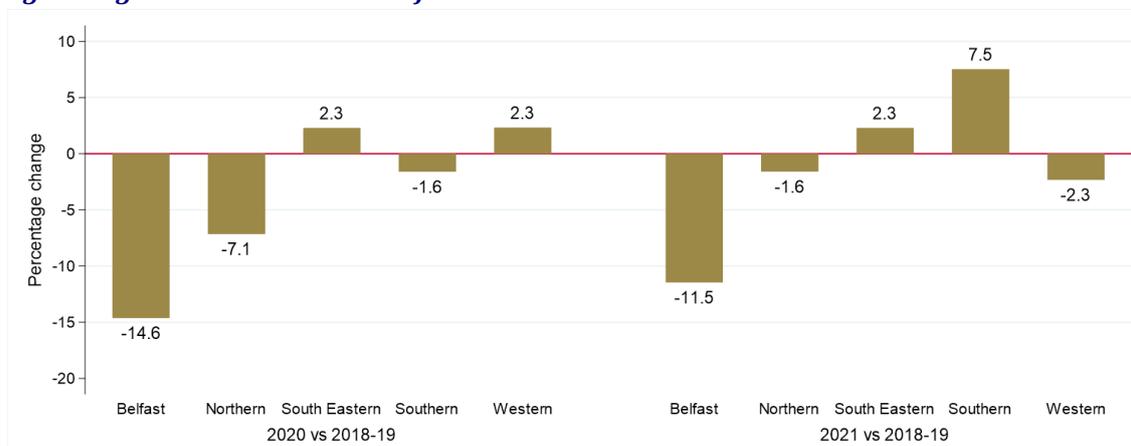
Note: Cases with unknown Health and Social Care Trust are included in totals.

Figure 4: Number of lung cancer cases diagnosed in April-December of 2018-2021 by Health and Social Care Trust and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



SOCIO-ECONOMIC DEPRIVATION

Excluding the first quarter of each year the number of cases of lung cancer diagnosed among those resident in the most deprived quintile decreased by 11.9% from 286 per year in 2018-2019 to 252 in 2021. Between the same two time periods the number of cases of lung cancer diagnosed among those resident in the least deprived quintile decreased by 4.9% from 163 per year in 2018-2019 to 155 in 2021. The change in case distribution by deprivation quintile between 2018-2019 and 2021 was not statistically significant.

Table 5: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by deprivation quintile and period of diagnosis

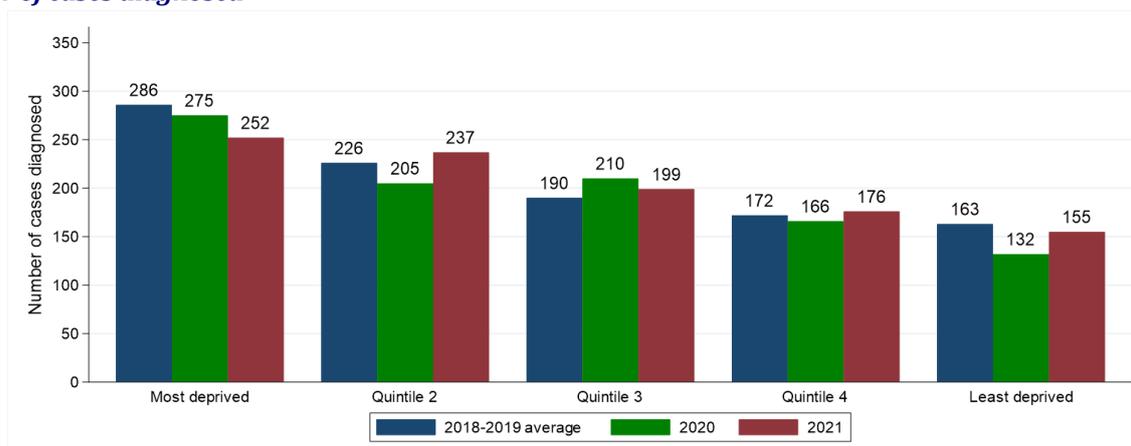
Deprivation quintile	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Northern Ireland	1,036	989	1,019	-4.5%	-1.6%
Most deprived	286 (27.6%)	275 (27.8%)	252 (24.7%)	-3.8%	-11.9%
Quintile 2	226 (21.8%)	205 (20.7%)	237 (23.3%)	-9.3%	+4.9%
Quintile 3	190 (18.3%)	210 (21.2%)	199 (19.5%)	+10.5%	+4.7%
Quintile 4	172 (16.6%)	166 (16.8%)	176 (17.3%)	-3.5%	+2.3%
Least deprived	163 (15.7%)	132 (13.3%)	155 (15.2%)	-19.0%	-4.9%

* Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.

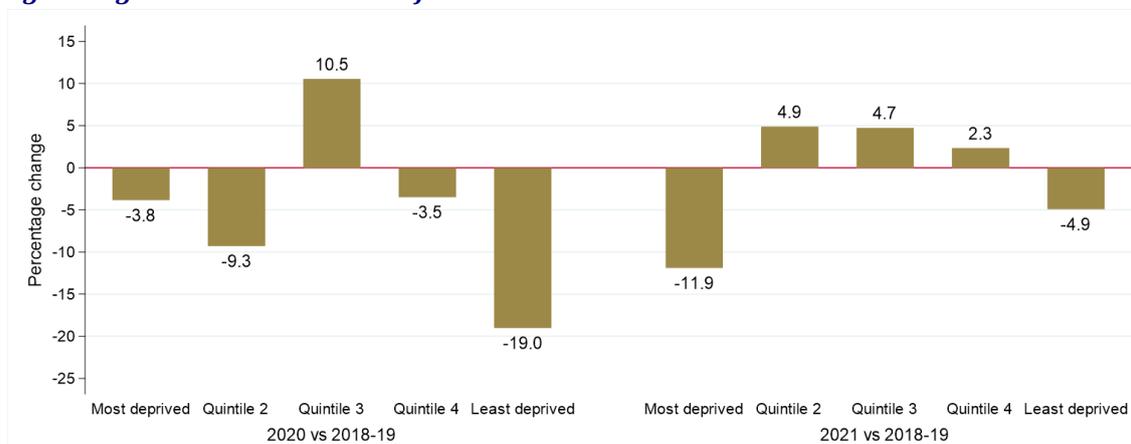
Note: Cases with unknown deprivation quintile are included in totals.

Figure 5: Number of lung cancer cases diagnosed in April-December of 2018-2021 by deprivation quintile and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



BASIS OF DIAGNOSIS

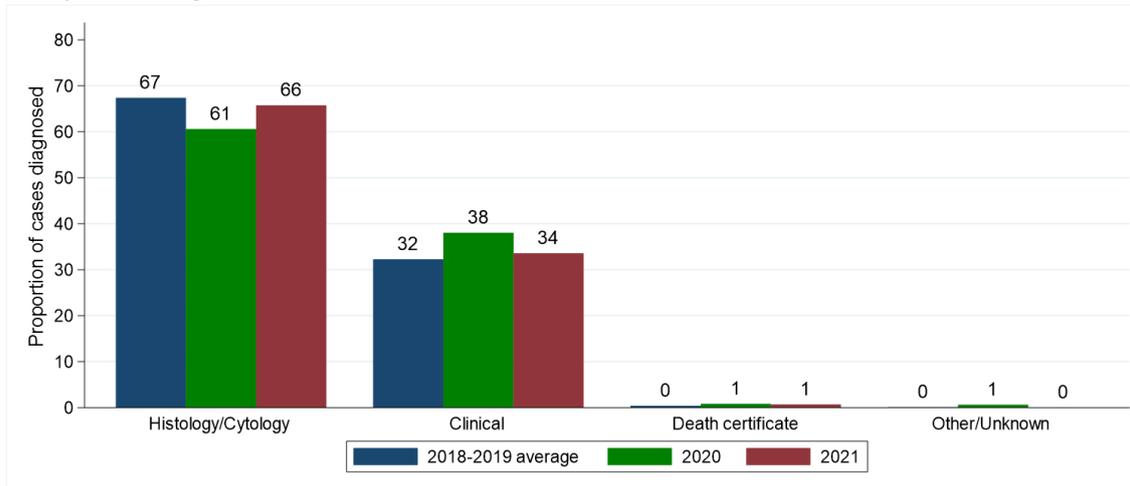
Excluding the first quarter of each year the number of cases of lung cancer diagnosed via histology/cytology decreased by 4.0% from 698 per year in 2018-2019 to 670 in 2021. As a proportion of all cases, histology/cytology diagnosis decreased from 67.4% in 2018-2019 to 65.8% in 2021. The change in case distribution by basis of diagnosis between 2018-2019 and 2021 was not statistically significant.

Table 6: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by basis and period of diagnosis

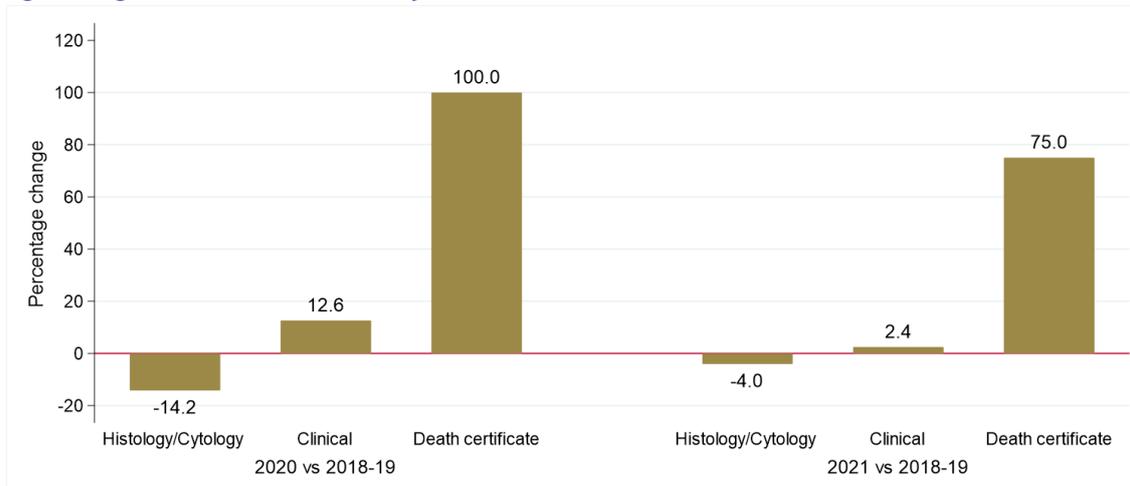
Basis of diagnosis	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All types	1,036	989	1,019	-4.5%	-1.6%
Histology/Cytology	698 (67.4%)	599 (60.6%)	670 (65.8%)	-14.2%	-4.0%
Clinical	334 (32.2%)	376 (38.0%)	342 (33.6%)	+12.6%	+2.4%
Death certificate	4 (0.4%)	8 (0.8%)	7 (0.7%)	+100.0%	+75.0%
Other/Unknown	1 (0.1%)	6 (0.6%)	0 (0.0%)	-	-

* Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.

Figure 6: Proportion of lung cancer cases diagnosed in April-December of 2018-2021 by basis and period of diagnosis
(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



STAGE AT DIAGNOSIS

The number of lung cancer cases diagnosed at stage I in April to December of each year decreased by 8.6% from 198 per year in 2018-2019 to 181 in 2021. In addition the number of lung cancer cases diagnosed at stage IV increased by 12.1% from 439 per year in 2018-2019 to 492 in 2021. As a proportion of all cases, stage IV diagnosis increased from 42.4% in 2018-2019 to 48.3% in 2021. The change in stage distribution between 2018-2019 and 2021 was statistically significant ($p = 0.011$).

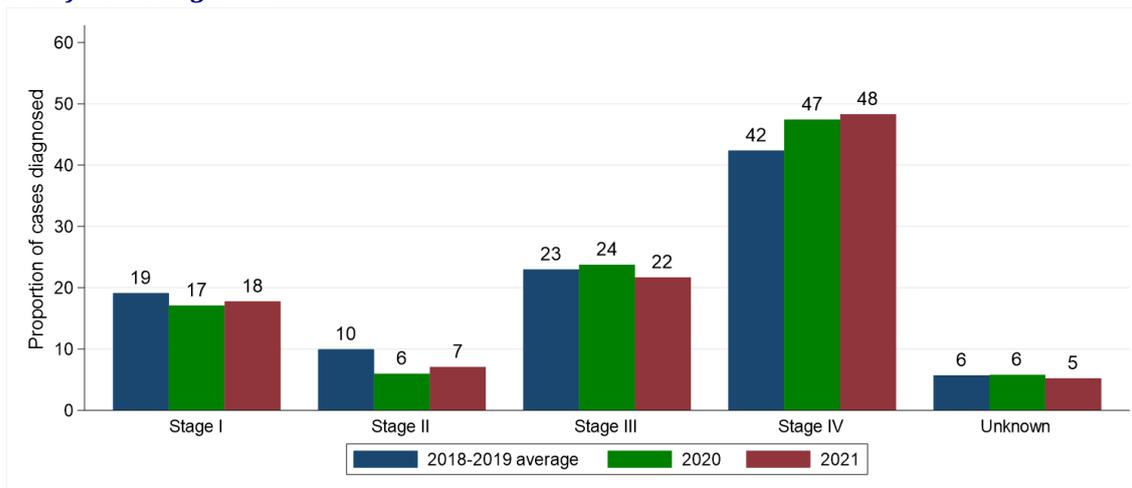
Table 7: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by stage and period of diagnosis

Stage at diagnosis	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All stages	1,036	989	1,019	-4.5%	-1.6%
Stage I	198 (19.1%)	169 (17.1%)	181 (17.8%)	-14.6%	-8.6%
Stage II	103 (9.9%)	59 (6.0%)	72 (7.1%)	-42.7%	-30.1%
Stage III	238 (23.0%)	235 (23.8%)	221 (21.7%)	-1.3%	-7.1%
Stage IV	439 (42.4%)	469 (47.4%)	492 (48.3%)	+6.8%	+12.1%
Unknown	59 (5.7%)	57 (5.8%)	53 (5.2%)	-3.4%	-10.2%

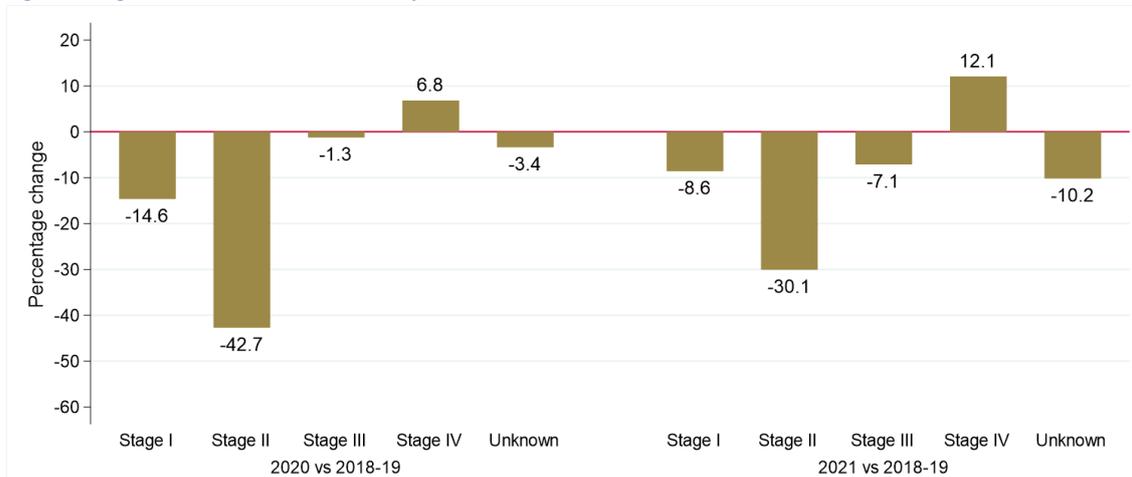
* Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.

Figure 7: Proportion of lung cancer cases diagnosed in April-December of 2018-2021 by stage and period of diagnosis

(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



TREATMENT

Excluding the first quarter of each year the number of lung cancer cases resulting in treatment by surgery within six months decreased by 23.1% from 130 per year in 2018-2019 to 100 in 2021. The resulting decrease in the proportion receiving surgery from 12.5% in 2018-2019 to 9.8% in 2021 was statistically significant ($p = 0.026$).

Between the same two time periods the number of lung cancer cases resulting in treatment by systemic therapy increased by 0.4% from 258 per year in 2018-2019 to 259 in 2021. The resulting increase in the proportion receiving systemic therapy from 24.9% in 2018-2019 to 25.4% in 2021 was not statistically significant.

The number of lung cancer cases treated with radiotherapy decreased by 2.9% from 349 per year in 2018-2019 to 339 in 2021. The resulting decrease in the proportion receiving radiotherapy from 33.7% in 2018-2019 to 33.3% in 2021 was not statistically significant.

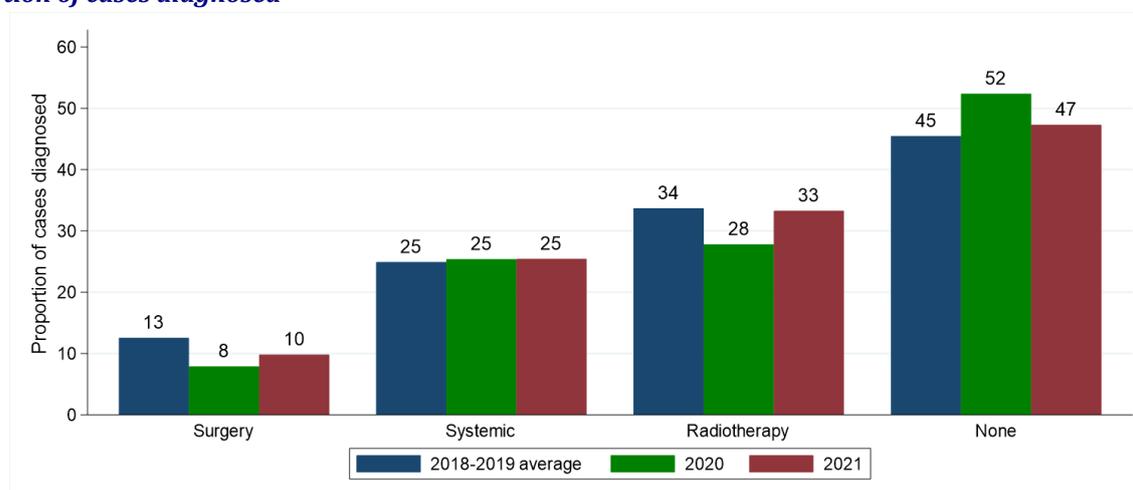
Excluding the first quarter of each year the number of lung cancer cases receiving none of these treatments within six months of diagnosis increased by 2.3% from 471 per year in 2018-2019 to 482 in 2021. The resulting increase in the proportion receiving none of these treatments from 45.5% in 2018-2019 to 47.3% in 2021 was not statistically significant.

Table 8: Number and proportion of lung cancer cases diagnosed in April-December of 2018-2021 by treatment type (within six months of diagnosis) and period of diagnosis

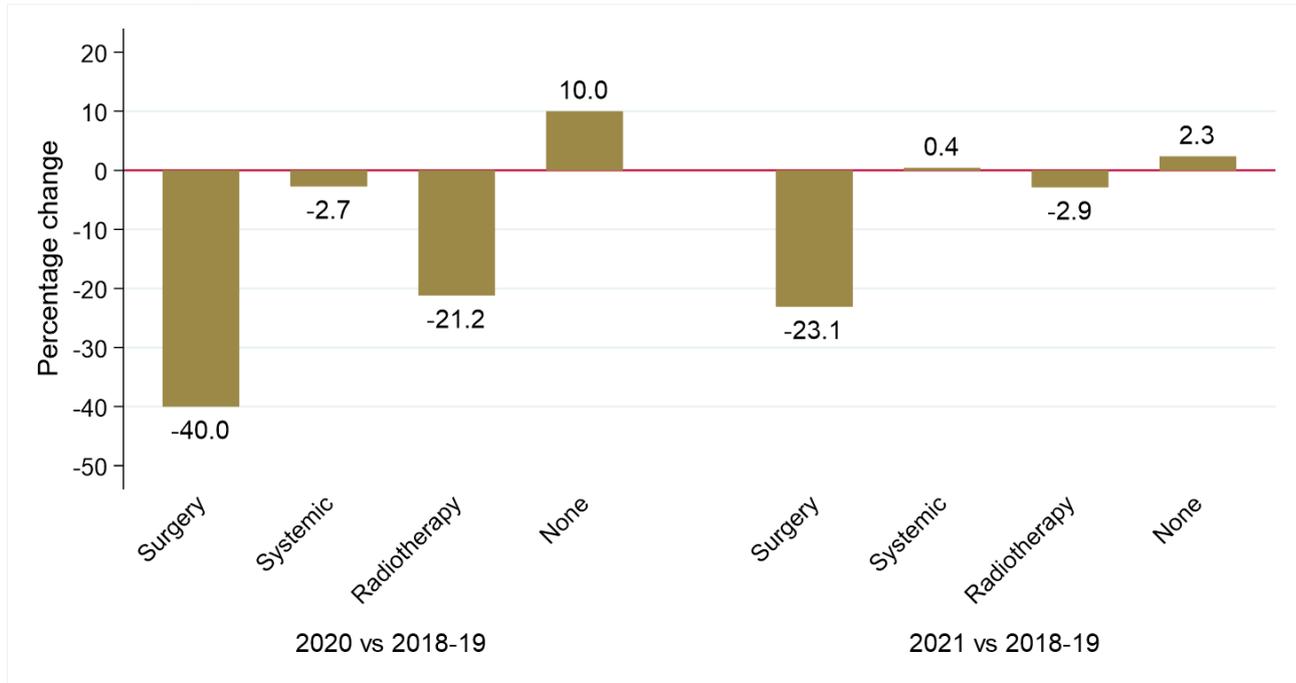
Treatment type	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Surgery	130 (12.5%)	78 (7.9%)*	100 (9.8%)*	-40.0%	-23.1%
Systemic therapy	258 (24.9%)	251 (25.4%)	259 (25.4%)	-2.7%	+0.4%
Radiotherapy	349 (33.7%)	275 (27.8%)*	339 (33.3%)	-21.2%	-2.9%
None of these treatments	471 (45.5%)	518 (52.4%)*	482 (47.3%)	+10.0%	+2.3%

* Statistically significant change compared to 2018-2019

Figure 8: Proportion of lung cancer cases diagnosed in April-December of 2018-2021 by treatment type (within six months of diagnosis) and period of diagnosis
(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



SURVIVAL

Changes in survival are evaluated using two measures. Observed survival examines the time between diagnosis and death from any cause. It thus represents what cancer patients experience, however, due to the inclusion of non-cancer deaths (e.g. heart disease), it may not reflect how changes in cancer care impact survival from cancer. Thus changes in age-standardised net survival are also examined. This measure provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It also assumes a standard age distribution thereby removing the impact of changes in the age distribution of cancer patients on changes in survival over time. While this measure is hypothetical, as it assumes patients can only die from cancer related factors, it is a better indicator of the impact of changes in cancer care on patient survival.

OBSERVED SURVIVAL

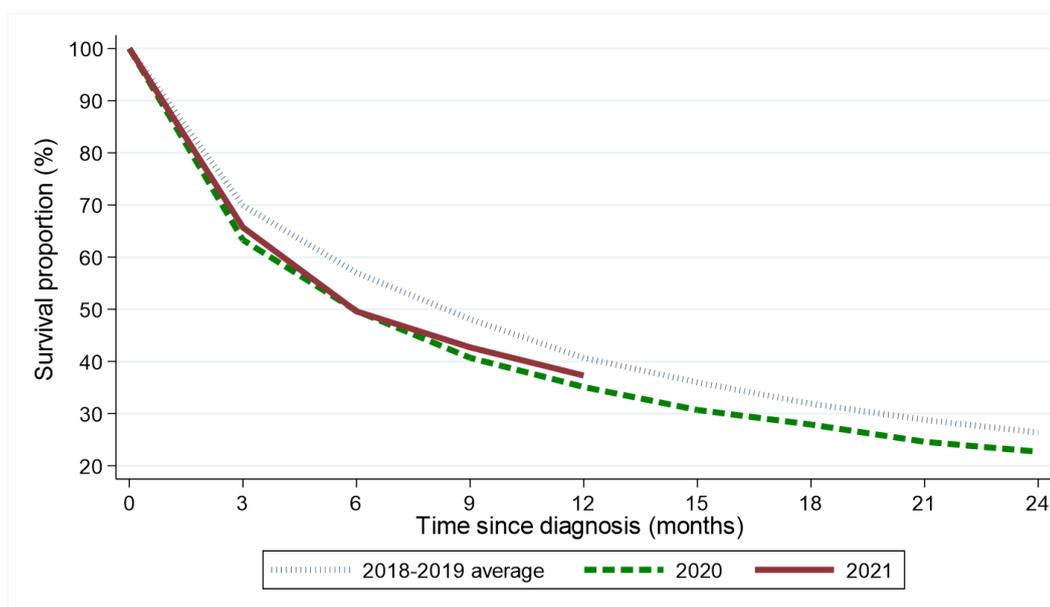
Survival among lung cancer patients six months after diagnosis decreased from 57.0% among those diagnosed in April-December of 2018-2019 to 49.6% among those diagnosed in April-December of 2021. This change was statistically significant. Between the same two diagnosis periods, one-year survival decreased from 40.7% to 37.3%. This change was not statistically significant. The log-rank test of equality indicates a statistically significant difference between the survival functions for 2018-2019 and 2021 ($p=0.025$).

Table 9: Observed survival for patients with lung cancer diagnosed in April-December of 2018-2021 by period of diagnosis

Survival time	Period of diagnosis (Apr-Dec)		
	2018-2019	2020	2021
Three months	69.9% (67.9% - 71.8%)	63.3% (60.2% - 66.2%)*	65.7% (62.6% - 68.5%)
Six months	57.0% (54.8% - 59.1%)	49.7% (46.6% - 52.8%)*	49.6% (46.5% - 52.6%)*
One year	40.7% (38.5% - 42.8%)	35.1% (32.1% - 38.1%)*	37.3% (34.3% - 40.3%)
Two years	26.4% (24.5% - 28.3%)	22.7% (20.1% - 25.4%)	-

* Statistically significant reduction compared to 2018-2019

Figure 9: Observed survival for patients with lung cancer diagnosed in April-December of 2018-2021 by period of diagnosis



DEATHS FROM COVID-19

During 2021 there were a total of 48 deaths from Covid-19 among lung cancer patients diagnosed at any point since 1993. Among the patients who died of Covid-19, 13 were diagnosed with lung cancer in 2021, 14 were diagnosed in 2020 and 21 were diagnosed in 1993-2019.

NET SURVIVAL

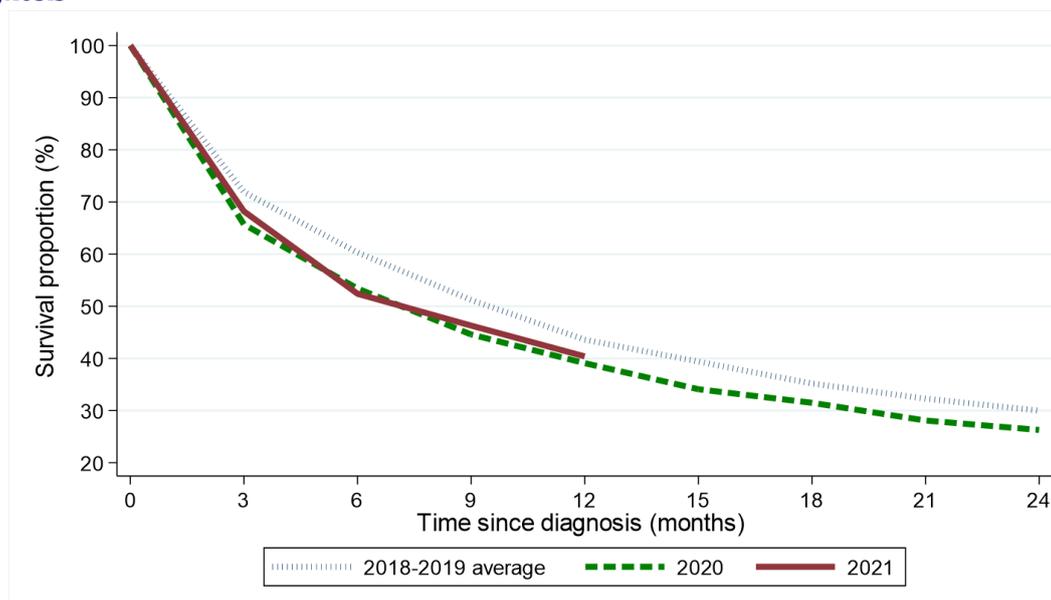
Net survival among lung cancer patients six months after diagnosis decreased from 60.3% among those diagnosed in April-December of 2018-2019 to 52.4% among those diagnosed in April-December of 2021. This change was statistically significant. Between the same two diagnosis periods, one-year net survival decreased from 43.6% to 40.4%. This change was not statistically significant.

Table 10: Age-standardised net survival for patients with lung cancer diagnosed in April-December of 2018-2021 by period of diagnosis

Survival time	Period of diagnosis (Apr-Dec)		
	2018-2019	2020	2021
Three months	71.9% (69.7% - 74.2%)	65.7% (62.4% - 69.1%)*	68.2% (65.1% - 71.5%)
Six months	60.3% (58.0% - 62.7%)	53.4% (50.1% - 57.0%)*	52.4% (49.0% - 56.0%)*
One year	43.6% (41.2% - 46.2%)	39.1% (35.8% - 42.7%)	40.4% (37.1% - 44.0%)
Two years	30.0% (27.8% - 32.4%)	26.3% (23.3% - 29.7%)	-

* Statistically significant reduction compared to 2018-2019

Figure 10: Age-standardised net survival for patients with lung cancer diagnosed in April-December of 2018-2021 by period of diagnosis



Note: All patients are followed up to the end of 2022. This enables calculation of two-year survival for patients diagnosed in 2018-2020, however only survival up to one year from diagnosis can be calculated for patients diagnosed in 2021.

MORTALITY

During the April-December period the number of deaths from lung cancer increased between 2018-2019 and 2021 by 2.1% from 778 deaths per year to 794 deaths.

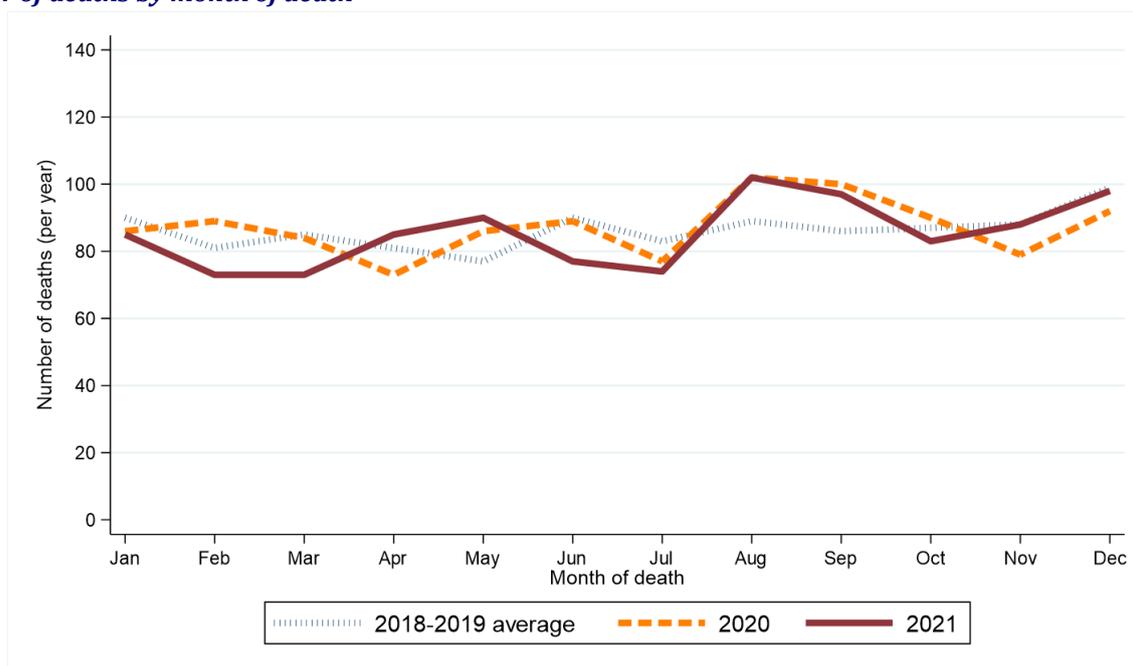
Table 11: Number of lung cancer deaths in 2018-2021 by month and year of death

Period of death	Annual total	Month death occurred											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2018-2019*	1,034	90	81	85	81	77	90	83	89	86	87	88	99
2020	1,047	86	89	84	73	86	89	77	102	100	90	79	92
2021	1,025	85	73	73	85	90	77	74	102	97	83	88	98

* Average deaths per year rounded to the nearest integer. Row sums may thus differ slightly from the total.

Figure 11: Number of lung cancer deaths in 2018-2021 by month/quarter and year of death

(a) Number of deaths by month of death



(b) Percentage change over time in number of deaths by quarter of death

